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July, 1991

IVHS ARCHITECTURE SUMMARY

What is System Architecture?

A system architecture is the master building plan. It can be thought of as the framework that conceptually describes how components interact and work together to achieve total system goals and objectives. Ideally, a system architecture provides for a modular design to allow for the system to grow and change over time, for example, to include additions of new components, or to accomodate new technologies.

Why Is a System Architecture Needed?

The architecture serves as the plan that guides how the system is built. In terms of IVHS, the architecture will guide how the building of IVHS will evolve over the course of time, with the goal of selecting a basic framework that will continue to sensibly support improvement, growth and incremental expansion into the foreseeable future. An IVHS architecture is needed to ensure that systems are built that are cost effective and will continue to meet system goals and objectives as traffic, environmental and energy conditions, travel demand and patterns, technologies and system solutions, and the political scene change and progress over the next several decades. It is vital that the architecture be designed in a systematic fashion so that these issues are all addressed openly, directly and carefully, rather than having the architecture evolve in an ad hoc fashion or having it dictated by the commercial interests of a dominant equipment supplier.

How Is a System Architecture Developed?

A typical process for synthesizing architectures would follow four basic steps: (1) definition of goals and objectives, (2) identification of those things IVHS might do that would contribute most towards meeting those goals and objectives, these point to the biggest opportunities for improvement, (3) identification and assessment of a range of solutions to these, and (4) synthesizing/refining architectures encompassing these solutions. These four steps are repeated a number of times. Each pass, or phase, involves more detailed analysis of a smaller set of solutions and architectures. The process is typical of any normal problem-solving process, and is directly analogous to the process a transportation system planner would follow in trying to identify the best way of meeting a transportation need.

How Long Will the Process Take?

In a sense, the process is never completed. The system architecture will need to be revised over time as goals and objectives change and new system capabilities are added, and as new technologies are developed which allow for development of more efficient mechanizations. Given the investment needed for national deployment of IVHS, it is critical that a process be developed that produces an effective architecture early in the program. But this architecture should be subjected to periodic review and revised as needed to allow for change in the future.

How Does System Architecture Relate to Protocols, Specifications, and Standards?

The system architecture defines interrelationships, system interface points and information flows among system components. It directly leads to establishment of protocols, and shows where specifications and standards need to be developed.

How Does a System Architecture Facilitate Private Sector Product Development?

Not only does the architecture provide a sensible basis for interface standards and protocols of the already defined elements, it also makes it possible for innovators with new product ideas to foresee what is required to tie them into IVHS.

How Does System Architecture Relate to the Strategic Plan?

The Strategic Plan guides how the development, testing and deployment of IVHS will evolve over time. The system architecture guides how systems will be built, given the milestones contained in the Strategic Plan that define when new capabilities will be ready for deployment. The processes for developing the Strategic Plan and the system architecture must be closely coordinated, and the two must be entirely consistent.

What Is the Role of the System Architecture Committee?

The Committee will serve as a focal point for review, coordination and discussion of system architecture activities sponsored by government agencies and private sector organizations. The Committee will provide technical reviews, advice and guidance to organizations involved with system architecture related work, and also work closely with counterpart organizations in Europe and Japan to achieve, to the extent possible, international coordination of system architectures. The Committee will not serve as the body that develops system architecture, it will serve as a forum for discussion of all relevant issues.

What Has the Committee Accomplished to Date?

The Steering Committee has met five times since last fall, and a meeting of the full Committee was held at the IVHS America Annual Meeting. The initial charge of the Committee was to recommend a process for developing a system architecture. This has been accomplished and a paper describing that process forwarded to the Coordinating Council. To initiate the process, the Committee has also developed a set of IVHS goals and objectives that will serve as a framework for evaluating architecture alternatives. The Committee is currently considering IVHS program recommendations for executing architecture development work as described in its recommended process. The Committee hopes to reach resolution on these recommendations at a meeting planned for October 2.

What Will be the Nature of the Program Recommendations?

There is agreement in the Committee that substantial resources need to be devoted to system architectural analysis as soon as possible, and that the process needs to incorporate broad representation from government and industry. The Committee is currently deliberating on the specifics of the initial actions that would best implement the steps described in its recommended process. The Committee plans to have specific program recommendations for the October 3 and 4 Coordinating Council meeting.